

J. Waldbury

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The Southern Agriculturist.

(NEW SERIES.)

Vol. V.

FOR DECEMBER, 1845.

No. 12.

From Boussingault's Rural Economy.

METEOROLOGICAL CONSIDERATIONS.

[Concluded from page 410.]

§ 5. *On the influence of agricultural labors on the climate of a country in lessening streams, &c.*

A question of great importance, and that is frequently agitated at this time, is, as to whether the agricultural labors of man are influential in modifying the climate of a country or not? Do extensive clearings of woods, the draining and drying up of great swamps, which certainly influence the distribution of heat during the different seasons of the year, also exert an influence on the quantity of running water of a country, whether by lessening the quantity of rain which falls, or by promoting the more speedy evaporation of that which has fallen?

In some districts it has been held, that the streams which had been used as moving powers, have very sensibly diminished. In other places, the rivers are said to have shrunk visibly; and in others, springs that were formerly abundant, have almost dried up. Observations to this effect appear to have been principally made in valleys, surmounted by mountains; and it is generally asserted, that the falling off in the springs and streams, had followed close upon the period at which the woods, scattered over the surface of the country, were cleared away without any kind of reserve.

These statements, which may be assumed as facts, seem to indicate that where the woods have been felled, it rains less than it did formerly; this, indeed, is the general opinion entertained on the subject; and were it admitted, without further examination, the natural inference from it would be, that the extension of agriculture diminishes the annual quantity of rain which falls in a country. But at the same time that the facts as stated have been observed, it has further been noticed that since the clearing of the surface from forests, the torrents and rivers which seemed to have lost in amount of regular supply of water, had become subject to sudden and extraordinary risings which had proved the cause of numerous and grave calamities. In the same way, springs that are generally all but dry, have been seen to burst forth again abundantly after violent storms. These latter observations, as may readily be imagined, are of a kind

that should lead us not lightly to embrace the vulgar opinion, which maintains that the cutting down of the woods has had the effect of lessening the mean annual quantity of rain; it is not only not impossible that this quantity has not varied, but it may even happen that the mass of water which passes over the bed of a stream, supposed shrunken, is actually the same as ever it was; the only difference may be, that now the flow is much less regular than it used to be: in former times the bed was always and more moderately full; at present it is excessively full at intervals only. It is very possible, therefore, that here as elsewhere, occasionally, the appearance of the fact has been taken for the reality. It were very important to discover some natural index to a solution of the question at issue: whether or not the destruction of the forests that once covered the face of a district of country, had had the effect of lessening the mean annual fall of rain?

The lakes which are met with in plains, and at different levels in mountain ranges, seem to me peculiarly well calculated to throw light on this subject. Lakes may, in fact, be received as natural gauges of the running waters of a country. If the mass of the water contained in the lakes undergo change in one direction or another, it is obvious that this change, and the direction in which it has occurred, will be proclaimed by the state or mean level of the lake or lakes, which will differ for the same reason that it does at different seasons of the year, viz: as drought or rain prevails. The mean level of the lake or lakes of a district will, therefore, fall, if the quantity of water which flows through that district diminishes; the level, on the contrary, will rise, if its streams increase; and it will remain stationary if the afflux and efflux of the lake continue unchanged. In the following remarks, I shall attach myself particularly to observations upon lakes which have no outlet, by reason of the facility with which any even slight change in the level of these must be discovered. I shall not, however, neglect those lakes which have an exit by a stream or canal, because I believe that the study of these may also lead to accurate enough results; the only point requiring preliminary remark, is the sense in which the words, change of level, are to be taken.

Geologists admit, that the level of the waters upon the surface of the globe has everywhere undergone great changes, whether attention be directed to the shores of the sea or to those of great inland lakes. This fact is universal, and is questioned by none, but great diversity of opinion prevails in regard to the cause of the phenomenon. Some pretend, that in many cases the change of level is only apparent,—that the body of water has not sunk, but that the shores have risen; others, again, maintain that there has been a true diminution in the mass of fluid, a true drying up, and that its level has actually sunk. I shall not, in this place, enter upon the great geological question; the variations which are there signalized are often of vast extent, and involve the supposition of violent catastrophes, which, in a general way, were long anterior to the historical epoch.

I shall only refer to changes of level observed in lakes by our ancestors or contemporaries; in a word, to facts which have taken place under the eyes of men, inasmuch as it is the influence of their agricultural labors upon the meteorological state of the atmosphere, which I am seeking to appreciate. The facts upon which I shall more particularly dwell, were observed in South America; but I shall show that what is true with regard to this continent, is true also with reference to any other continent.

One of the most interesting portions of Venezuela is, undoubtedly, the valley d'Aragua. Situated at a short distance from the sea-board, possessed of a warm climate, and of a soil fertile beyond example, it combines within itself all the varieties of agriculture that belong in peculiar to tropical regions; on the hillocks which rise in the bottom of the valley, are seen fields which bring to mind the agriculture of Europe. Wheat succeeds pretty well upon the heights which surround La Vittoria. Bounded on the north by a chain of hills which run parallel with the sea-board, and to the south by the range which separates it from Llanos, the Aragua Valley is limited on the east and west by a series of lesser elevations, which shut it in completely. In consequence of this peculiar configuration of country, the rivers which rise in its interior have no outlet to the ocean; their waters accumulate in the lowest part of the valley, and form the beautiful lake Valentia. This lake, which M. de Humboldt says exceeds the lake Neufchâtel in size, is raised about 1300 feet above the level of the sea; it is about ten leagues in length, and about two leagues and a half where it is widest.

At the time when M. de Humboldt visited the Aragua Valley, the inhabitants were struck with the gradual diminution which had been going on in the waters of the lake during the last thirty years. It was enough to compare the statements of older writers with its condition at this time, to obtain conviction that the waters had, in fact, very much diminished. Oviedo, for instance, who visited the valley frequently towards the end of the sixteenth century, says, that the town of New Valencia was founded in 1555, at the distance of half a league from the lake; in 1800, M. de Humboldt ascertained that the lake was upwards of 549 yards, or upwards of $3\frac{1}{4}$ miles, instead of about $1\frac{1}{4}$ mile from its banks.

The appearance of the surface also gives new proof of the fact of the recession of the water; certain hillocks which rise in the plain still preserve the title of islands, which, undoubtedly, they formerly received with propriety, when they were surrounded by water. The land which had been left by the retreat of the lake, soon became transformed into beautiful plantations of cotton-trees, bananas, and sugar-canes. Buildings which had been erected on the banks were left, year after year, further and further from them. In 1796, new islets made their appearance. An important military position, a fortress built in 1740, in the Isle de la Cabrera, was then upon a peninsula. Finally, in two islets of granite, M. de Humboldt disco-

vered, several yards above the level of the lake, a bed of fine sand, mixed with fresh-water shells. These facts, so certain, so unquestionable, did not pass without numerous explanations from the wise men of the country, who, as if by common consent, fixed upon a subterranean exit for the waters of the lake. M. de Humboldt, after the most careful examination of all the circumstances, did not hesitate to ascribe the diminution of the waters of the lake Valencia to the extensive clearings which had been effected in the course of half a century in the Aragua valley. "In felling the trees which covered the crowns and slopes of the mountains," says this celebrated traveller, "men in all climates seem to be bringing upon future generations two calamities at once—a want of fuel and a scarcity of water.*

In the year 1800, the population of this favored valley, where the cultivation of indigo, of cotton, of cocoa, and the cane had made immense progress, was as dense as it was in the most thickly populated districts of England or France, and every one was delighted with the appearance of comfort that prevailed in the numerous villages of this industrious country.

Twenty-five years after M. de Humboldt, I explored in my turn the Valley d'Aragua, having fixed my residence in the little town of Maracaibo. The inhabitants had now remarked that for several years, not only had the lake ceased to diminish, but that it had even risen very perceptibly. Some fields that were formerly covered with cotton plantations were now submerged. The Isles de las Nuevas Aparcidas, which had risen from the waters in 1796, had again become shoals dangerous to navigation; the tongue of earth, De la Cabrera, on the north side of the valley, had become so narrow that the slightest rise in the water of the lake covered it completely; a continuous N. E. wind was sufficient to flood the road which led from Maracaibo to New Valencia; in short, the fears which the inhabitants of the lake had entertained for so long a period had entirely changed their nature; they were now no longer afraid of the lake drying up; they saw with dismay that if the water continued to rise as it had done lately, it would in no long space of time have drowned some of the most valuable estates, &c. Those who had explained the diminution of the lake by supposing subterraneous canals, now hastened to close them up in order to find a cause for the rise in the level of the water.

In the course of the last twenty-two years, important political events had transpired. Venezuela no longer belonged to Spain; the peaceful valley d'Aragua had been the theatre of many a bloody contest; war to the knife had desolated this beautiful country and decimated its inhabitants. On the first cry of independence raised, a great number of slaves found freedom by enlisting under the banners of the new republic; agricultural operations of any extent were abandoned, and the forest, which makes such rapid progress in the

* Humboldt, vol. v. p. 173.

tropics, had soon regained possession of the surface which man had won from it by something like a century of sustained and painful toil. With the increasing prosperity of the valley many of the principal tributaries to the lake had been turned aside to serve as means of irrigation, so that the beds of some of the rivers were absolutely dry for more than six months in the year. At the period which I now refer to, the water was no longer used in this way, and the beds of the rivers were full. Thus with the growth of agricultural industry in the Valley d'Aragua, when the extent of cleared surface was continually on the increase, and when great farming establishments were multiplied, the level of the water sunk; but by and by, during a period of disasters, happily passing in their nature, the process of clearing is arrested, the lands formerly won from the forest are in part restored to it, and then the waters first cease to fall in their level, and by and by show an unequivocal disposition to rise.

I shall now, without, however, quitting America, carry my readers into a district where the climate is analogous to that of Europe, where the surface is occupied by immense fields, covered with the cereals as with us. I speak of the table-lands of New Granada, of those valleys raised from 10,000 to 13,000 and 14,000 feet above the level of the sea, in which the mean temperature throughout the year ranges from 58° to about 62 Fahr. Lakes are frequent in the Cordilleras; and it would be easy for me to describe a great number; I shall, however, confine myself to those which became subjects of observation in former times.

The village of Ubaté is now situated in 'the neighborhood of two lakes. Some seventy years ago these two lakes formed but one; the old inhabitants saw the water shrinking and new fields presenting themselves year after year. At this present time fields of wheat of extraordinary luxuriance occupy levels that were completely inundated thirty years ago.

It is enough indeed to perambulate the neighborhood of Ubaté, to consult the old sportsman of the country, and to refer to the annals of the various parishes, to be satisfied that extensive forests have been cut down in the whole of the surrounding country: the clearing, in fact, still continues; and it is certain that the recession of the waters, although much slower than it was in former times, has not yet entirely ceased.

A lake, situated in the same valley, to the east of Ubaté, deserves our particular attention. By means of barometric measurements, made with extreme care, I found that this lake had precisely the same level as that of Ubaté. Nearly two centuries ago, it was visited by Piedrahita, Bishop of Panama, an author of great accuracy, to whom we owe the history of the conquest of New Granada. He states this lake to be ten leagues in length, by three leagues in breadth; but Dr. Roulin having had occasion, a few years ago, to make a plan of the lake, he found it a league and a half in length, by one league in breadth; my own impression is, that at the time Piedrahita wrote, there was but a single lake, extending all the way

from Ubaté to Zimijaca, not two lakes as at present, a supposition which would take away every thing like exaggeration from the statement of Piedrahita. But the fact of the retreat of the waters of these lakes is unquestioned; the inhabitants of Zimijaca all know that the village was founded close to the lake, whereas, at the present time, it is nearly a league from its banks. Formerly, there was no difficulty in obtaining all the building timber that was wanted; the mountains which rose from the valley on either hand were covered up to a certain height with the trees proper to these cold regions; the oak of the Andes abounded; numerous myrcias were also in existence, from which abundance of wax was obtained; at the present time these mountains are almost stripped of their trees, an event mainly brought about by the eagerness to procure fuel in manufacturing salt from the springs of Taosa and Enemicon.

To these authentic facts, which I could multiply and support by many others of a similar kind, it may be replied, that the diminution of the water, incontestable as it is, might perhaps have taken place without the clearing away of the forests. It may indeed be maintained, that the drying up of the waters is owing to a totally different cause, altogether unknown to us; that it must be ranked among the numerous phenomena, the reality of which we perceive, but without being able to render any account of their cause.

I cannot, in the instance last quoted, as in that of the lake of Valencia, refer to any increase of the lake connected with the suspension of agriculture, or the reappearance of the forest. I might, however, adduce in favor of the opinion which I defend, the slowness with which the decrease in the lakes of the valley of Ubaté has lately gone on, and since the felling of trees in the neighborhood has almost entirely ceased. Extensive plots of fertile ground are now no longer left dry and available to the husbandman by the retreat of the lake; he already begins to think of means for obtaining by artifice that which nature, assisted by the clearing of the country, presented him with in former times. In the year 1826 there was a speculation on foot for draining the valley completely by cutting a canal and letting off the water. Further proof of the fact which I am urging is obtained in another way. It is not difficult to show, that lakes in the immediate vicinity of those that have shrunk most remarkably, but around which no destruction of the forest has taken place, have undergone no change in their level. The lake of Tota, situated at no great distance from the valley of Ubaté, at an elevation that must approach 13,000 feet above the level of the sea, in a region where vegetation has almost entirely disappeared, has preserved its pristine level unaltered. The lake is nearly circular; and Piedrahita, in 1542, gives it two leagues in breadth. It is subject to violent storms, which render its navigation dangerous; and even travelling along its banks, from the particular circumstances in which the road is situated, with the lake on one hand and a perpen-

dicular cliff upon the other, is not without risk. In 1652, the road passed as it does at present, the water laving the foot of the same rocks, and its level having suffered no change, any more than the sterile country which surrounds it.

I shall conclude what I have to say on the lakes of South America by speaking of that of Quilatoa, because it has been made the subject of accurate observations sufficiently remote from one another—1740 and 1831.

Living at Latacunga, a town situated at no great distance from Cotopaxi, the traveller is sure to hear of the wonders of the Laguna da Quilatoa. From time to time, this lake, it is said, casts forth flames which set fire to the shrubs and withered grass that grow upon its banks, and frequent detonations are heard, the sound of which extends to a great distance. M. de la Condamine, in 1738 visited this lake, which he found of a circular form, and about 1278 feet in diameter; on the 28th November, 1831, I also visited the Lake of Quilatoa. It cannot be better compared to any thing than to the crater of a volcano filled with water; I found it nearly 13,000 feet above the level of the sea, in the cold region, therefore; and indeed it is surrounded with immense pastures; but the information which I obtained from the shepherds in the neighborhood of the Lake of Quilatoa, dissipated all that was marvellous in its history; they had never seen any flames issue from its bosom, they had never heard any detonations; in short, I found the lake as M. de la Condamine appears to have found it, every thing having remained for nearly a century without change.

The study of the lakes which are so common in Asia, would probably supply conclusions similar those deduced from observations made in South America, viz: that the waters which irrigate a country diminish as the forests are cleared away, and as agriculture extends. The recent labors of M. de Humboldt, which have thrown so much new light upon this quarter of the world, appear to leave no doubt upon the subject. After having shown that the system of the Altai is about to lose itself by a succession of slopes in the steppes of Kirgiz, and that consequently the Ural chain is not connected with that of the Altai, as was generally believed, this celebrated geographer shows, that precisely in the situation where the Alghinic mountains are usually set down, a remarkable region of lakes commences, which extend into the plains that are traversed by the Ichim, the Omsk, and the Obi.* It would appear that these numerous lakes are remainders as it were of an immense sheet of water, which formerly covered the whole of the country, and which had become divided into so many particular lakes by the configuration of the surface. In crossing the steppe of Baraba, in his way from Tobolsk to Baraoul, M. de Humboldt perceived everywhere that the drying up of waters increases rapidly under the influence of the cultivation of the soil.

* Humboldt, *Fragmens Asiaticques*, t. i. p. 40-50.

Europe also possesses its lakes; and we have still to examine them from the particular point of view which engages us. M. de Saussure, in his first inquiries in regard to the temperature of the lakes of Switzerland, examined those which are situated at the foot of the first line of the Jura. The Lake of Neuchâtel is eight leagues in length, and its greatest breadth does not exceed two leagues. On visiting it, Saussure was struck with the extent which this lake must formerly have possessed; for, as he says, the extensive level and marshy meadows which terminate it on the southwest, had unquestionably been covered with water at a former period.

The Lake of Bienné is three leagues long and one broad; it is separated from the lake of Neuchâtel by a succession of plains that were probably inundated.

Lake Morat is also separated from the Lake of Neuchâtel by low and level marshes, which beyond all question were formerly submerged. Unquestionably, adds Saussure, the three great lakes of Neuchâtel, Bienné, and Morat, were formerly connected, and formed one great sheet of water.*

In Switzerland, as in America and Asia, the old lakes, those that may be spoken of under the title of the primitive lakes, and which occupied the bottoms of the valleys when the country was uncultivated and wild, have become divided, and now form a variable number of smaller and independent lakes. I shall wind up the present subject by referring to the observations of Saussure upon the Lake of Geneva, which may be looked upon as the starting point of the admirable works of this distinguished philosopher.

Saussure admits, that at an epoch long anterior to the times of history, the mountains which surround this lake were themselves submerged; a great catastrophe let off this immense collection of water, and by and by the current possessed no more than the bottom of the valley; the Lake of Geneva was formed.

In merely considering the monuments left by man, it is impossible to doubt that within 1200 or 1300 years the waters of the Lake of Geneva have gradually fallen in their level. It is evidently upon the levels which have thus been left that the quarter de Rive, and the lower streets of the city of Geneva have been built. This depression of the surface, continues Saussure, is not merely the effect of any deepening of the bed of the Rhone, by which the lake is discharged; it has also been produced by a diminution in the quantity of water which flows into it.

The conclusions which it seems legitimate to draw from the observations of Saussure are, that in the course of from 1200 to 1300 years the quantity of running water has sensibly diminished in the districts around the Lake of Geneva. No one will, I apprehend, deny that in this long period there have not been extensive clearings of forest lands in Switzerland, and a continual increase in the

* Saussure, *Voyage dans les Alpes*, t. ii. chap. 6.

extent of cultivated land in this beautiful country. Here, consequently, as elsewhere, an attentive examination of the levels of the lakes leads us to conclude, that where extensive clearings from forest have been effected, where agriculture has extended, that there has in all probability been diminution of the running waters which irrigate the surface; while in those districts where no change has been effected, the amount of running streams does not appear to have undergone any variation.

The effect of forests considered in this point of view would therefore be to keep up the amount of the waters which are destined for mills and canals; and next to prevent the rain-water from collecting and flowing away with too great rapidity. That a soil covered with trees is further less favorable to evaporation than ground that has been cleared, is a truth that all will probably admit without discussion. To be aware that it is so, it is enough to have travelled, a short time after the rainy season, upon a road which traverses in succession a country that is free from forests, and one that is thickly wooded. Those parts of the road that pass through the unencumbered country are found hard and dry, while those that traverse the wooded districts are wet, muddy, and often scarcely passable. In South America, more perhaps than anywhere else, does the obstacle to evaporation from a soil thickly shaded with forests, strike the traveller. In the forests the humidity is constant, it exists long after the rainy season has passed; and the roads that are opened through them remain through the whole year deeply covered with mire; the only means known of keeping forest ways dry, is to give them a width of from 260 to 330 feet, that is to say, to clear the country in their course.

If once the fact is admitted that running streams are diminished in size by the effect of felling the forests and the extension of agriculture, it imports us to examine whether this diminution proceeds from a less quantity of rain, or from a greater amount of evaporation, or whether perchance it may be owing to the practice of irrigation.

I set out with the principle that it must be next to impossible to specify the precise share which each of these different causes has in the general result; I shall, nevertheless, endeavor to appreciate them in a summary way. The discussion will have gained something if it be proved that there may be diminution of running streams in consequence of clearing off the forests alone, without the whole of the causes being presumed to act simultaneously.

With regard to irrigation, it is necessary to distinguish between that case in which an extensive farm has been substituted for an impenetrable forest, and that in which an arid soil, which never supported wood, has been rendered productive by the industry of man. In the first case it is very probable that irrigation will have contributed but little to the diminution in the mass of running water; it may readily be imagined that the quantity of water used up by a

dense forest will equal, at all events, if not exceed, that which will be required by any of the vegetables which human industry substitutes for it. In the second case, that is to say, where a great extent of waste country has been brought under cultivation, there will evidently be consumption of water by the vegetation which has been fostered upon the surface; agricultural industry will thus tend to diminish the quantity of water which irrigates a country. It is extremely probable that it is to a circumstance of this kind that we must ascribe the diminution of the lakes which receive so large a proportion of the running streams of the north of Asia. It is almost unnecessary to add, that in circumstances of this kind the effect which is due to the simple evaporation of rain-water is not increased; the loss by this means must be rather less, because from a surface covered with plants evaporation takes place more slowly than from one that is devoid of vegetation.

In the considerations which I have presented upon the lakes of Venezuela, of New Granada, and of Switzerland, the diminution may be directly ascribed to a less mean annual quantity of rain; but it may with equal reason be maintained to be a simple consequence of more rapid evaporation.

There are, in fact, a variety of circumstances under the influence of which the diminution of running streams can be shown to be connected with more active evaporation. I shall confine myself to the mention of two particular instances, one noticed by M. Desbassyns de Richemond, in the Island of Ascension; the other is from observations by myself, and is among the number of facts which I registered during my residence for several years at the mines of Marmato.

In the Island of Ascension there was an excellent spring situated at the foot of a mountain originally covered with wood; this spring became scanty and dried up after the trees which covered the mountain had been felled. The loss of the spring was rightly ascribed to the cutting down of the timber. The mountain was therefore planted anew, and a few years afterwards the spring reappeared by degrees, and by and by flowed with its former abundance.

The metalliferous mountain of Marmato is situated in the province of Popayan, in the midst of immense forests. The stream along which the mining works are established is formed by the junction of several small rivulets which take their rise in the table-land of San Jorge. The country which overlooks the establishment is thickly wooded.

In 1826, when I visited the mines for the first time, Marmato consisted of a few miserable cabins, inhabited by negro slaves. In 1830, when I quitted the country, Marmato had the most flourishing appearance; it was covered with workshops, it had a foundry of gold, machinery for grinding and amalgamating the ores, &c., and a free population of nearly three thousand inhabitants. It may be readily imagined, that in the course of these four years an immense quantity of timber had been cut down, not only for the construction

of machinery and of houses, but as fuel, and for the manufacture of charcoal. For facility of transport, the felling had principally gone on upon the table-land of San Jorge. But the clearing had scarcely been effected two years before it was perceived that the quantity of water for the supply of the machinery had notably diminished. The volume of water had been measured by the work done by the machinery, and actual gauging at different times showed the progressive diminution of the water. The question assumed a serious aspect, because at Marmato any diminution in the quantity of the water, which is the moving power, would be of course attended with a proportional diminution in the quantity of gold produced. Now, in the Island of Ascension, and at Marmato, it is highly improbable that any merely local and limited clearing away of the forest, should have had such an influence upon the constitution of the atmosphere as to cause a variation in the mean annual quantity of rain which falls in the country. More than this as soon as the diminution of the stream at Marmato was ascertained, a pluviometer, or rain-gauge, was set up, and in the course of the second year of observation a larger quantity of rain was gauged than in the first year, although the clearing had been continued; still there was no appreciable increase in the size of the running stream.

A couple of years of observation are unquestionably insufficient to show any definitive variation in the annual quantity of rain that falls. But the observations made at Marmato still establish the fact that the mass of running water had diminished in spite of the larger quantity of rain which fell. It is therefore probable that local clearings of forest land, even of very moderate extent, cause springs and rivulets to shrink, and even to disappear, without the effect being ascribable to any diminution in the amount of rain that falls.

We have still to inquire whether extensive clearings of the forest—clearings which embrace a whole country—cause any diminution in the quantity of rain that falls. Unfortunately, the observations which we have upon the quantity of rain which falls in particular districts, are only of sufficient antiquity and accuracy in Europe to be worthy of any confidence, and there the soil was cleared before observation, in the generality of instances, began.

The United States of America, where the forests are disappearing with such rapidity, will probably one day afford elements for the complete and satisfactory solution of the question, whether or not the cutting down of forests causes any diminution in the quantity of rain which falls in the course of the year.

In studying the phenomena accompanying the fall of rain in the tropics, I have come to a conclusion which I have already made known to many observers. My own opinion is, that the felling of forests over a large extent of country has always the effect of lessening the mean annual quantity of rain.

It has long been said, that in equinoctial countries the rainy season returns each year with astonishing regularity. There can be no doubt of the general accuracy of this observation, but the meteoro-

logical fact must not be announced as universal and admitting of no exception; the regular alternation of the dry and rainy season is as perfect as possible in countries which present an extreme variety of territory. Thus, in a country whose surface is covered with forests and rivers and lakes, with mountains and plains, and table-lands, the periodical seasons are quite distinct. But it is by no means so where the surface is more uniform in its character. The return of the rainy season will be much less regular if the soil be in general dry and naked; or if extensive agricultural operations take the place of the primeval forest; if rivers are less common, and lakes less frequent. The rains will then be less abundant; and such countries will be exposed, from time to time, to droughts of long continuance. If, on the contrary, thick forests cover almost the whole of the territory, if its rivulets and rivers be numerous, and agriculture be limited in extent, irregularity in the seasons will then take place, but in a different way; the rains will prevail, and in some seasons they will become as it were incessant.

The continent of America presents us, on the largest scale, with two regions placed in the same conditions as to temperature, but in which we successively encounter the circumstances which are most favorable to the formation and fall of rain in one case, and to its absence in the other.

Setting out from Panama, and proceeding towards the south, we encounter the Bay of Cupica, the provinces of San Bonaventura, Choco, and Esmeraldas; in this country, covered with thick forests and intersected with a multitude of streams, the rains are almost incessant; in the interior of Choco, scarcely a day passes without rain. Beyond Tumbez, towards Payta, an order of things entirely different commences; the forests have entirely disappeared, the soil is sandy, agriculture scarcely exists, and here rain is almost unknown. When I was at Payta, the inhabitants informed me that it had not rained for seventeen years! The same want of rain is common in the whole of the country which surrounds the desert of Sechura, and extends to Lima; in these countries rain is as rare as trees are.

In Choco, where the soil is thickly covered with trees, it rains almost continually; and on the coasts of Peru, where the soil is sandy, without trees, and devoid of verdure, it never rains; and this, as I have said, under a climate which enjoys the same temperature, and whose general features and distance from the mountains are nearly the same. Piura is not more remote from the Andes of Assuay than are the moist plains of Choco from the Western Cordillera.

The facts which have now been laid before the reader seem to authorize me to infer—

1st. That extensive destruction of forests lessens the quantity of running water in a country.

2d. That it is impossible to say precisely whether this diminution is due to a less mean annual quantity of rain, or to more active evaporation, or to these two effects combined.

3d. That the quantity of running water does not appear to have suffered any diminution or change in countries which have known nothing of agricultural improvement.

4th. That independently of preserving running streams, by opposing an obstacle to evaporation, forests economize and regulate their flow.

5th. That agriculture established in a dry country, not covered with forests, dissipates an additional portion of its running water.

6th. That clearings of forest land of limited extent may cause the disappearance of particular springs, without our being therefore authorized to conclude that the mean annual quantity of rain has been diminished.

7th, and lastly. That in assuming the meteorological data collected in intertropical countries, it may be presumed that clearing off the forests does actually diminish the mean annual quantity of rain which falls.

Note by the English Editor :

These meteorological observations are highly interesting, and worthy of every consideration. That unforesting a country makes it absolutely drier, seems unquestionable; but whether that be in consequence of less rain falling, or of that which falls going further, making more show, cannot be easily determined. It does not seem very legitimate to decide, that because a country is covered with wood, therefore it is wet: the converse of that proposition appears much more probable—viz: that because a country is wet, therefore it is covered with trees. There is one part of the ocean which is called by mariners "The Rains;" because it rains there almost ceaselessly, as it does in the province of Choco: but "The Rains" has no forests to account for its dripping sky. Did that region consist of dry land instead of salt-water, then doubtless its surface would be covered, as that of Choco is, with an impenetrable forest. The subject is adverted to here, however, not to discuss the general question, but to throw out the suggestion that under the hand of man, the soil and even the climate of our immense Australian possessions might possibly be improved. Drought is the grand enemy of Australian settlers; and the country is generally barren of wood.

Governors, district governments, and farmers, and all who are interested in the prosperity of the colony, surely ought to encourage, by every possible means, the growth of the taller trees and shrubs that are indigenous to the country.

Expeditions might be made once or twice a year, at the proper season, for scattering or planting the seeds of these trees or shrubs. Could every knoll within a hundred miles of Sidney be seen crowned with a thick screen of leafy trees, there can be little doubt but that the rain which falls would be economized; and that the beds of the rivers, instead of being dry for eight or nine months, would be occupied all the year round by at least a moderate stream of water.

THE SCIENCE OF GOOD HUSBANDRY.

Mr. Camak :—Under the above caption Xenophon has detailed a conversation between Socrates and Ischomachus—of which a sketch, in part, may not prove unacceptable to the readers of the *Southern Cultivator*. Socrates was considered the great founder of ancient moral and mental philosophy—and his name stands out from the past, the most conspicuous and shining light of antiquity.

Speaking of the improvement of estates, it was observed that stewards or overseers should be as good as the master—as careful and unremittingly industrious *as if the owner were present* during his absence. None other would avail. An estate is not strictly *property*, unless it be *profitable*. The time and attention of owners should be bestowed on a plantation; as a Persian king being asked what made his horse so fat, replied, the “eye of the master.”

Money itself is valueless in hands extravagant or unknowing how profitably or felicitously to invest it. Every thing is valuable only by its right use, more than possession. The best opulence is to be satisfied with your estate, whatever it be. But a good, thrifty and prudent wife enhances one's wealth by retaining and preserving what he brings in. And Ischomachus praised his wife for an obedient, amiable and diligent woman; hence he was admired by Socrates as a thrice happy man, well meriting the popular title of “*the Just*.”

Work should be done with regular diligence and constancy, but not so headlong as to fatigue too much.

Rich men should not be above working manually, with their own hands. Cyrus, the greatest monarch of Persia, was instanced as having *daily labored before meals*, and his extensive and beautiful orchard, was mainly laid out and planted by his own hands. But to be engaged in any way, at the study, or in the field or the workshop, was in Socrates' opinion, commendable employment. I quote some of his translated words :

“By husbandry the ground gives us every thing necessary for food and nourishment, and such things likewise, as afford the greatest pleasures. Yet, though it gives us plentifully of all kinds of things, yet it does not allow us to reap them in sloth and idleness; but excites us to health by the labor it appoints us. * * * The practice of husbandry makes men strong and bold—enabling them to defend their country. What science is there that brings man more advantage for his labor. * * * He was surely a wise man that said husbandry was the mother and nurse of all the other sciences; for when she flourished all the other sciences and faculties fared the better; but when the ground lies uncultivated and brings no crop, all the sciences and arts are at a loss by land and sea. * * * It is a healthful employment, breeds good men, and occasions generosity of spirits and good will towards one's friends and country.”

Ischomachus instanced the treatment of slaves: to carefully reward the diligent and lay as many hardships as you can on the idle and careless. Bad managers and fretful masters make bad servants.

Be firm, but not outrageous. Nothing spoils or desponds a good servant so much as to see the idle and unworthy put on a level with him, or praised and promoted before himself. Dishonest overseers or drivers, no matter howsoever industrious and diligent, are not to be continued. Honesty in such is as valuable a quality as industry. "As to slaves," said Socrates, "we should not act on the laws of Draco and Solon alone, by punishing the bad, but upon those also of the Medes and Persians, by rewarding the good and deserving."

"Husbandry is profitable," continued Socrates, "to proficients, but exceedingly unprofitable to the ignorant, though not requiring length of time to understand. The principal difficulties are as to the soil. On it philosophers are rather occult; yet, the constituents of soils may be discovered by observing what best grows upon them."

"Plough fallow lands in the spring, as it is too wet in winter and too dry in summer. Weeds and grass turned in before the seeds mature, improve the soil, as also green crops ploughed in," observed Ischomachus.

"The sun's rays correct the rawness and sourness of earths. Not convenient to sow when dry. Good sowing requires experience, as seeds should be equally distributed over the ground," remarked Socrates.

"Ditch, to drain off superfluous waters; manure at every rate must be had—improvidence to be without it. Weeds laid under water rot, and constitute manure equal to dung. Water, in a still place on earths, too, convert them to manure.

"In planting trees never exceed three feet in depth, for any kind but the olive. The best width of the hole is two and a half feet. In planting the olive tree have clay at the bottom," said Socrates. "The land by its production is always the best teacher of its fitness. Dry and calcareous earths should be laid on sour unproductive soils." This, I think an idea of the *lime* of the moderns.

Socrates and his friend Ischomachus, then the best husbandmen in Greece, agreed that generous masters, especially with good servants, are more successful than the indiscriminately cruel.

It would appear from the above sketch of a long conversation, that the ancients were but little, if at all, inferior to the moderns in the cultivation of the soil. Even the experiences of two or three thousand years, are, to many, at this day, as unknown and unpractised as if Greece and Socrates never existed. Thus goes the world, folly and ignorance being always the same disagreeable things.

As the ancients remarked, the great difficulty to this day is, in finding the proper constituents of soils. They were ignorant of our gaseous derivations and chemical properties, or they might have handed down to us a manual, obviating many difficulties with which we have now to contend, notwithstanding our boasted wisdom.

J. J. FLOURNOY.

Wellington, Sept. 1845.

[*Southern Planter.*]

LET FARMERS COMMUNICATE—IMPROVEMENT.

Mr. Editor:—Farmers should be communicative of their agricultural knowledge. They should be as willing to give information to a brother, as they are particularly anxious to receive the like at the hands of others. They should inquire, search, experiment, and endeavor to advance the general agricultural interests by every possible means and measure. What should be thought of a farmer, who, having the necessary right kind of knowledge to double his own harvest—which very properly and prudently he does—yet, will not impart one iota of the secret to his neighbor, that he may do the same? Such there may be, but assuredly he is unworthy that appellation “brother farmer.”

The real genuine farmer is wholly given to the work. Next to his duties due high Heaven, it is his all absorbing topic. He loves to *hear* about farming; he loves to *talk* about farming; the *study* of farming is to his taste. He thinks, reads, composes, reflects and stores his mind with treasures of knowledge applicable to the profession. All other knowledge is acquired only to subserve the interests of this. In this way, the farmer *must* and *will* rise. It is as necessary to the prosperity, the onward and upward march of the farmer, that he study and apply the stores of knowledge, to the work of his hands as in any profession or business whatever. Let him patiently and perseveringly do it then, and look up and live.

Farmers should take courage under a view of the immense change in his favor there has been wrought within the last thirty years. Thirty years ago! Where then was the flood of agricultural reading now sent forth to enlighten the land and make glad the hearts of the hearty yeomanry! And what was the state of agricultural science? Did the farmer then suppose science had any thing to do with the practice of husbandry? What too was then the state of agricultural implements? What for a plough did he turn the stubborn glebe with? and what for a cultivator and hoe did he essay to till the half broken field with? Indeed, farmers can tell, for they know.

Farmers, under a sense of what has been done and is now being done for them, should look up, respect themselves, and adore that Providence that has so kindly undertaken to advance their general weal.

Butter's Vale, Dec. 1845.

B. F. WILBUR.

[*Southern Cultivator.*]

SILK.

There will shortly be a struggle to determine which State makes the most, as well as the best silk. The best silk in the country is from cocoons, spun in Vermont. It is larger and stronger than silk raised in any of the Southern or Western States. The Vermont silk brings a higher price at Patterson, New Jersey, [say \$5.25 per lb.] than silk from any other State.

N. Y. Sun.

For the Southern Agriculturist.

SUGGESTIONS FOR REMOVING THE SALTS FROM RICE FIELDS.

Mr. Editor :—In your last number, I read with pleasure and improvement, the communication of Dr. J. Lawrence Smith to the Agricultural Society, and beg leave to offer a suggestion in addition to the means proposed by him for removing the salts from rice-fields so "poisonous to vegetation,"

I premise by observing that these salts are as poisonous to animal as to vegetable life, and I appeal to the experience of all rice-planters, that drinking ditch water in their rice-fields, by causing cholera and dysentary, destroys more negroes than any other source of disease. I am told that the laboring negroes are so inconsiderate, that even if wholesome water is brought down to them in the field, rather than go for it to the adjoining banks they will stoop down and drink the water from the nearest ditch.

To prevent this loss of health—loss of work—loss of life and expense of attendance on the sick, as well as the injury to the rice-crop, I recommend that the ditches be kept thoroughly drained. Frequent falls of rain and flowings of the fields will wash the copperas and alum from the land into the ditches; but if left there evaporation caused by the sun and high winds will ensue, and the proportion of these salts greatly increased. If this be followed by a drought, these salts will be reabsorbed into the soil and even appear like frost on the surface. To prevent these injurious effects both on health and vegetation, an invariable rule should be enforced on every rice plantation, that the trunk-minders uniformly run off the *whole of the water from the ditches, and keep them drained*; it is especially necessary when the people are working in the fields.

In addition to this, I recommend that from the time of harvest until the time of working the land for a new crop, it should be a rule to flow the fields at every new moon and at every full moon; to leave on the water a day or two for it to settle and become clear, and then to drain it off thoroughly from the ditches. This alternate flowing and draining the fields throughout the winter, not only dissolves and washes off these noxious salts, as they continue to form of themselves in the soil, but does much good besides. Every flowing of the fields, if left for a day or two leaves a deposit of mud, and this deposit is greatest in freshets and in spring-tides. This mud is one

of the finest of manures, it is the humus of writers on agriculture ; it contains all the decayed and decaying vegetable and animal matters that can be washed from the immense inland swamps and marshes overflowed by the water thus offered, by a bountiful Providence to afford sustenance to man and other animals. By alternate flowing and draining, the seeds injurious to the succeeding crop, will be sprouted and rotted, so as to prevent much injury from grass and volunteer rice. By this plan also the stubble and grass roots will be more completely rotted and added to the soil, than by being constantly flowed or constantly dry. This occasional flowing only continues two days in fourteen, and thus leaves the surface exposed to be gleaned by the birds twenty-four days in every month.

AN OCCASIONAL READER.

EFFICACY OF AMMONIA IN CASES OF POISON.

Extract of a letter from Dr. Church to the Editor of Siliman's Journal of Science, dated Cooperstown, N. Y., February 6th, 1829.

A young man in this place had accidentally overset a hive of bees, and before he could escape, they had settled, in great numbers, on different parts of his body and limbs and stung him very severely. It was about half an hour after the accident happened, when he came to my office in great agony, and he had scarcely time to give an account of it before he fainted. I immediately applied the ammonia to the parts that had been stung, his legs, arms, and breast. He directly recovered from his faintness, and experienced no pain or other inconvenience afterwards.

It is several years since I first used the aqua ammoniæ, to counteract the effect of the bites of insects and stings of bees, and it has invariably produced instant relief—generally complete. I have often seen children crying in excessive pain from the sting of a bee, and on application of the ammonia they would immediately cease complaining and become cheerful, so complete and sudden is the relief it produces. I always use it for mosquito bites, and they never trouble me farther. I was led to use it in these cases, from the instantaneous effect it was said to have in counteracting the operation of prussic acid. In the second number of the American Journal of Medical Sciences, (Philadelphia,) for the last year, it will be seen that Dr. Moore, of Alabama, used it with great success in the cure of bites of venomous serpents. From his account, it is probable that the pure uncarbonated aqua ammoniæ is most efficacious. I have sometimes noticed, and think it must be on account of its being sometimes carbonated and at others not. [Farmer's Cabinet.

THE PLOUGH IN THE GARDENS.

Messrs. Fleet & Starr—Dear Sirs :—Ten years experience in this country has convinced me that an entirely different system of Gardening should be pursued to that of Europe. In England those who employ good gardeners, have generally a noble estate, descended from their ancestors, and together with it, an abundant income, to keep the estate in first rate order. Here where fortunes have to be acquired, generally, by personal industry, and perseverance, it is not to be supposed that Proprietors under these circumstances will be so lavish of expenditure. It appears to me then a mistake to lay out grounds after the plan of English proprietors. The first expense may not be grudged, but the after expense of keeping the place in repair *is always so*. I believe brother gardeners will bear me out in the assertion that in nine cases out of ten, there is an unwillingness to allow sufficient help, or means, to keep places in any thing like order, either in England or here. The consequence is a disgust rather than pleasure, on the part of both gardener and employer.

To obviate these difficulties, then, I would propose, that the vegetable garden at any rate, should be without box edgings and gravel walks, and so situated as to be easily worked with a plough, cultivator, &c—a square or oblong is always best in form—and instead of the old fashioned four quarters and subdivisions into beds, and alleys, for each kind of vegetable, let there be a continuous row of each, the whole length or breadth of the garden, sown or planted, say $2\frac{1}{2}$ feet apart, and worked with one horse and cultivator or plough without mould board—a garden so worked will be found profitable, the bulk of the work being done by a farm laborer, it gives the gardener a little more time and opportunity to attend to the multiplicity of other matters that must not be neglected, and which occupy an immense amount of time, care, and attention seldom noticed by his employer.

The objection to the plough in the garden on account of want of depth, is happily done away with now that we have the subsoil plough—a plough that ought to be much more general in use.

I know that gardeners generally have a prejudice against the plough in the garden, and till within a few years I was among the number—but I can tell them from five years experience with the plough, that it is far the easiest, most expeditious, and quite effectual; I raised good crops, and spent by far the most pleasant five years service in my life—pleasant because by means of the plough, I could get crops in season, and my work always *before* me.

Very respectfully yours,

G. K.

Newark, Oct. 14th, 1845.

[N. Y. Far. & Mec.]

Bees generally eat more honey than they collect after the first of August. Weigh your hives and see for yourselves.

AN OUTLINE OF AN AMERICAN VINEYARD FROM THE START.

Mr. Editor :—The following outline is the result of years of successful experiments :

1. Select the best tested American grapes—particularly such as are found to mature well, whether the vines are young or old ; if you wish such as will bear forthwith, take those well rooted of several years standing in the nursery.

2. Plant in manner of fruit trees, ten feet each way ; except the scuppernong : twenty feet for them.

Trim in summer or early in fall, tying up one or two main stems unchecked in length to stakes for a year or so ; after which, insert a post with two cleats nailed each side of the upper square end to hold rails or scantling for making the frame for the outspreading canopy of vines above. After the vines have started over said frame, no more trimming is necessary, except it may be to cut off any straggling branches under the canopy that all may be kept clear beneath for say six or seven feet high.

3. As to soil, any will do with proper management. I have the finest of good bearing vines in almost all kinds ; from the light sandy to the stiff clayey. And as to strength of soil, there is more danger of having land too rich than too poor, as to the bearing properties of vines. As a general principle, ground that will bring good corn is plenty rich for vines, provided you dig or plough, or both, some depth and width, when the vines set, and put manure or surface soil at the bottom of the opening, and then cover with common earth e're planting, that no manure or too rich soil may come in contact with the roots to endanger their safety in case of a drought the first season after planting.

4. The best mode of keeping up due fertility of soil, is this, viz : in connection with never suffering your vineyard at any time of year to become grassy or weedy, to be particularly careful to scarify the ground ; and after fall frosts, that no leaves or litter from your vines blow off, or become incorporated with the soil beneath the canopies. Nature's mode of keeping up and increasing the fertility of woodlands, taught me this mode, and the very best too of manuring vineyards, or what is more than equivalent thereto.

5. The foregoing is the whole secret of having a first rate vineyard, the *ripe* fruit of which is the most healthful as well as pleasant, and can be enjoyed for several months in the year ; the wines from which are in no danger of adulterations ; and as to a family medicine, according to the voice of experience, and of most eminent physicians, the very best single healing one in the *Materia Medica* ; and also an anticipator of disease in sickly places and seasons, when taken temperately, say after dinner.

A few additional little matters, and I close this off hand hastily written article.

1. I tie my vines with elm bark, which being got in spring, are at any season ready when soaked, and outlasts any strings I have ever tried.

2. In a wet season I insert posts, with what we call *jobbers*—that is, a piece of wood say three feet long, sharpened at one end, and a strong peg inserted through the other end for raising it by a stake or crow-bar, when driven into the ground by a maul or beetle. Into the hole made thereby, insert your post, say two or more feet deep.

Posts at any time can be renewed when giving way, by propping up the part of the canopy above. Posts of any lasting wood had better be charred at the little end, so as to stand inversely from the way they did when growing as a tree. According to statements I have read in agricultural periodicals, they will last much longer when thus inverted, or standing as it were upside down.

Pardon the hasty and desultory style of this communication, and believe me ever yours, and a hearty well wisher of all deserved success in your avocation in the best of all arts and sciences, as that of Agriculture is the foundation of all the rest.

SIDNEY WELLER.

Brinkleyville, Halifax co., N. C., Sept. 16, 1845.

[*Am. Farmer.*

P. S.—Editors friendly to the American Vineyard cause, will please copy this.

S. W.

SUCCESS OF AMERICAN VINEYARDS.

Halifax County, N. C.

Messrs. Fleet & Starr.—Seeing some disquisitions lately in your valuable periodical on the manner of planting the grape vine, I concluded to forward you a few thoughts on that and like matters. Notwithstanding exceptions, and they made evident in the given cases, it may be laid down as a rule, that success in any branch of agriculture, as well as in most other pursuits, is the best *prima facie* evidence of right procedure therein; or that there is an intimate connection established by Providence between the attainment of any object of enterprize and all the steps that led thereto. To apply this rule to my vineyards:—After some dozen years of culture I have, most flourishing and prolific, six acres of vines, old and young, part of which, the older, form a continuous canopy say eight or ten feet high, over head, and underneath nothing to intercept the passage of wind, teams or people; or nothing to be seen underneath but the main stems of the vines, from ten to twenty feet each way, and posts ten feet apart. The planting of all my vines was on the principle common with my other procedure on the farm in that respect, viz: in reference to the fact of all the vegetable creation having tap and lateral roots, and that both must be sustained in some appropriate way, that the desired end of prolific issue may be attained. Some plants may be called top-rooted, because mainly depending on top-roots, as cotton, turnips, &c. Others lateral-rooted because mostly sustained by their lateral roots, as corn, &c. But both kinds

of roots must, as a general rule, have their office sustained or no adequate success will be had in their culture. But so far from a culture exactly adapted to either, in my experience, that I have had desired success in a method common to both. For instance while I raise turnips by putting manure in drills and bedding thereon, and then planting. I have done the same with corn, and like success, with this difference only, that turnips, to have the bed raised with an eye to drawing dirt from them in cultivating—and corn with a hollow rather when planted, except it be in a low or damp location. But it may be laid down as a rule, that no planting or culture should be so deep as to neglect the existence and sustaining lateral roots near the surface, or near enough thereto for the sun's heat to have its genial influence. So with vines and trees; you even do a violence to their nature to plant or cultivate them too deep, which violence will be revenged generally by a small or no yield at all. The general rule for planting fruit trees, will aptly apply to that for vines, viz: to plant an inch or so deeper than they stood when growing in the nursery. I say in the nursery as to vines as well as trees, for I consider and practise that grape-vines should first be cultivated in the nursery a year or so before eligible for setting out in the vineyard. The scuppernong, as not growing from cuttings, I first root by layers and then make them well rooted vines in the nursery ere planting in vineyard or selling. But other kinds of vines I cultivated first in the nursery by cuttings, often being thickly set in drills three feet apart. By the by, fall planting is decidedly most successful for cuttings. Frequent discouragements in vineyard culture, arise from attempts to start vineyards with cuttings and not well rooted plants.

And whatever is said of European culture of short distance apart and humble height, and of servile imitation of foreign modes in our country, certainly the American mode of 10 or 20 feet apart, and say 30, 40, 60 or more length of branches on scaffolding, would seem to make an *up-hill business* of beginning a vineyard with cuttings. Plants as well as animals are of gigantic growth in America compared with *Eastern size*. And no success has yet been attained, and I predict never will be by *thwarting* instead of *aiding* nature in vine culture. Hence the reiterated abortive attempts of foreigners to succeed with the vineyard business in our country. All attempts at planting vines very deep or cutting off upper roots and the like will generally prove worse than useless trouble in America. All the disturbing of lateral roots of my vines is that of the mere surface ones by shallow working with cultivators, harrows and the like to prevent the undergrowth of any thing, and to incorporate all fallen leaves with the soil beneath the canopies; as equivalent to nature's plan of keeping up the fertility of the woods. But to conclude these hastily written and desultory remarks. I will state briefly the yield of a quarter of an acre of vineyard nearest my house, and managed *from the start*, according to the above hinted American plan. The kinds of vine are mostly scuppernong with some of my Halifax,

Norton's V. Seedling and Cunningham—besides, grapes gathered and shaken (the scuppernong grapes by holding a large sheet underneath the canopies and shaking the branches above with a forked stick, when all ripe ones fall,) to makes vines—quantity not calculated precisely, but say several barrels; the following drains upon said quarter were had for more than a month—viz: Visitors daily therein to pluck the fruit on the advertising terms of twenty cents each entrance, and commutation for companies (partaking standing on fixtures to reach the grapes above)—and grapes gathered to carry away at prices of forty cents per gallon. Frequently twenty or thirty visitors a day, and at one time sixty, and another ninety-five white persons, besides colored servants—mostly partaking of the fruit of said quarter of an acre. When the ninety-five had eaten abundantly and retired, some of the company went back to see the change of appearance as to fruit on the canopies, and reported they could not miss the grapes, or no perceptible alteration as to appearances of branches well loaded everywhere. In short, the calculation is that from visitations and sales of grapes and product of vine, this quarter acre yielded at least 50 dollars profit the season, or at rates of the interest on 800 dollars, or more than 3,000 dollars the acre. This statement to those not conversant with the prodigious bearing qualities of a well managed American vineyard may appear incredible. But the same statements in other periodicals, as the *Cultivator*, read in my region would jeopardise my veracity if not true. My list of vines you may see in the November number of the "*Albany Cultivator*;" which list have the goodness to transfer into your columns as if for you written. Strain the grape juice through several folds of a woolen blanket and then add at least two pounds of sugar per gallon, and my word for it, a good wine will be the result; and better for some tastes at least, than if a fourth of spirits added and one pound of sugar per gallon.

In haste, yours, &c.

SIDNEY WELLER.

[*N. Y. Far. & Mec.*

Brinkleyville, Halifax Co., N. C., Oct. 22, 1845.

PRUNING STONE FRUIT IN THE FALL.

Have any of our readers ever made experiments between pruning peach trees and other stone fruit, in the fall, summer, or spring? In the following article taken from the *Gardener's Chronicle*, the writer contends that the fall is best in England; yet we doubt whether his reasons will hold good in the drier climate and more frosty winters of this country; and we are still of opinion that the months of May and June are the best here for pruning peach as well as all other trees.—*Amer. Agricult.*

"It is a well known fact that just before or just after the leaves are falling in autumn, when sufficient sap is in motion, and in its downward course, a more speedy and perfect cicatrization will be

effected than in spring. Those who have been in the habit of making cuttings of shrubs, &c., well know that if the cuttings are put in early in autumn, success is beyond a doubt, but if they are delayed until late in the season, or until spring, that failure is as certain. In the former case, a callosity is formed by the descending sap, and roots are eventually sent out, and a plant is established; in the latter, no callosity is formed, and the cutting dies. It may be inferred from this, that the wounds are healed by the descending sap before the approach of winter; so much so, that no moisture can enter from without, and hence no injury can result from frost.

"There is another important consideration which must not be overlooked in favor of autumn pruning. In many parts of England, the young wood of the peach does not ripen to the extremities, more particularly in wet seasons, and the consequence is that early frosts rend the bark in all directions, the sap escapes, and the un-ripened part of the shoot dies. This is of common occurrence. Were their shoots shortened in autumn instead of in spring, just while there is action enough left to heal the wounds perfectly, the declining energy of the tree would be economized; for instead of being uselessly expended in assisting to repair the extremities of the shoots, which are ultimately to be cut off, it would be husbanded in the parts left, which would of course be greatly strengthened, and the buds would also assume a prominent, healthy and vigorous appearance. I am strongly of opinion that autumn is decidedly the best time for pruning every kind of stone fruit, for the reasons I have advance."

TO DIMINISH THE DRAUGHT OF PLOUGHS.

We may consider that upon an average, 35 per cent. of the labor of ploughing is attributable to the weight of the implement, 55 per cent. to the operation of cutting the furrow-slice, and only ten to the action of the mould board. This conclusion, if it be correct, reverses most of our pre-conceived opinions on the subject: the attempts which have been made to diminish the draught of ploughs have been mostly directed to the alteration of the form of the mould board; let our plough-makers direct their efforts more to facilitate the action of the sock and coulter, and to diminish, within safe limits, the weight of the implement, and they will probably, be more successful in lessening its draught.

[*Gardener's Chronicle:*

AGRICULTURE PROMOTED BY MANUFACTURES.

Those counties in this State in which there are manufactories, have, with few exceptions, increased in population, while those having few or none, have decreased for the last five years.

[*N. Y. Far. & Mec:*

EARLY CULTURE OF RICE, COTTON, &c.

Messrs. Locke & Davis,—Every tradition or record that conveys down the stream of time any information relative to the introduction, culture or product of rice, cotton, &c., at an early period of our colonial history, is interesting, as it demonstrates the practicability of introducing exotics into our country, and the adaptation of our soil and climate to an illimitable production; rendering them not only staple commodities of the country, but an intrinsic blessing to the world.

I observe in your paper of the 27th Oct., that Mr. Fessenden, of Warren, (R. I.) attributes to Capt. Thurber the introduction of rice, through Governor Landgrave Thomas Smith, of South-Carolina, from Madagascar, in 1694 or '97. I have an old work before me, "The Gentleman's Magazine, by Sylvanus Urban, Gent," which contains the following article "on the introduction of rice and tar in our colonies:"

"In 1696, Mr. Collinson writes that his sagacious friend, Charles Dubois, then Treasurer to the East India Company, told him often, with pleasure, that he first put the Carolinians on the culture of rice. He happened one day, in that year, to meet Thomas Marsh, a Carolina merchant, at the coffee-house, to whom he said, I have been thinking, from the situation, nature of the soil and climate, that rice may be produced to great advantage in Carolina. Accordingly, a money bag full of East India rice was given to Marsh, and he sent it to South-Carolina; and in the year 1698, he told his friend Dubois that it had succeeded very well."*

About this time a Portuguese vessel arrived with slaves from the East with a considerable quantity of rice, being the ship's provisions; this rice the Carolinians gladly took in exchange for a supply of their own produce. The first account we have of the shipment of rice is from Mr. Sam'l Eveligh, a merchant of *Charlestown*, who writes that from the year 1726 to 1727, were exported 40,000 barrels; from '29 to '30, exported 41,957; from '40 to '41, exported 80,000; from '55 to '56, exported 60,000; from '57 to '58, exported 67,000; from '60 to '61, exported 100,000; from '61 to '62, exported 34,972 whole barrels and 3,600 half barrels, having turned their hands to making Indigo, of which they exported 239,629 pounds. With regard to tar and pitch, you are aware, Messrs. Editors, that England had to look to Sweden and Norway for a supply, until it rose to 50 shillings a barrel, when *Capt. Coram*, institutor of the Foundling Hospital, made the first barrel of tar in New England, in 1698.

With regard to cotton, tradition in my boyhood, placed Mr. John Screven, the father of my mother-in-law, among the first who planted black-seed cotton on Beaufort, S. C., and at the cottage near Beaufort. At first he picked out the seed, but found it so tedious he contrived two rollers to go by two cranks turned with the hand, which

* See an extended account of this in vol. IV p. 9, *Southern Agriculturist*, 1844.

ginned out some 10, 15 or 20 lbs. per day, and from these small beginnings the world is now clad in its fabric.

Will it be too vast a flight for the imagination to look through the vista of time and see shrubberies of the Tea plant and Coffee tree about the Capes of Florida? You know, Messrs. Editors, that the Tea plant or Thea, so strongly resembles the Camelia in its botanical character, that it has been referred to that genus, and of the same genus is our Casseno or Georgia Tea tree; and in China they have the Thea Viridis and the Thea Bohea, or the green tea district and the black tea district. In the vicinity of Pekin, the latitude and climate is said to be similar to that of Philadelphia, and the *Imperial Tea* is only made in one district of Japan, from the first gathering at the end of the winter, when the leaves are only a few days old and reserved for the wealthy. The plant requires seven years to attain a height of six feet, and is then trimmed down to produce a greater quantity of beans; precisely the treatment we use with the Tpon, Casseno, or Georgia Tea tree, when planted for an ornamental hedge or set out in a cone. Tea was unknown in Europe until the middle of the 17th century, and an effort should be made to introduce its culture here, as they are propagating the Tea shrub in Brazil, with the aid of Chinese laborers, and even in Japan and Java, they employ Chinese cultivators.

Yours, &c.

GLYNN.

[*Savannah Republican.*]

POTATO ROT.

To the Editor of the N. E. Farmer :

I observe in European newspapers recently arrived, that the French Academy of Arts and Sciences deputed Mr. Charles Morren, of Liege, to examine into the cause of the potato rot. That the French should have selected a foreigner for this purpose, says more for the high esteem in which his talents are held, than any thing which can emanate from me.

This gentleman has stated the result of his investigation to be, that the rot is caused by a *fungus* the spores or seeds of which exist in vast quantities in the atmosphere, and this opinion has been generally received as true by the best informed circles in Europe. I have not seen the paper by Professor Morren, and therefore do not know whether he suggests any remedy or not.* You well remember that the result of my observations on this disease, published in your paper last year, perfectly accords with that of Professor Morren, and that the remedy I proposed, of *salt*, was founded on the power of this substance to dissolve and destroy most of the fungus family; hence where there was salt, the spores could not vegetate. I also regretted, (and much more regret now, as the disease has caused such extensive devastation,) that I did not possess a microscope of sufficient perfection to enable me to pursue my examinations both

* See *Southern Agriculturist*, page 433.

into the disease and its remedy: the want of this alone made me drop all further investigations on the subject. But previous to this, I repeated and considerably extended my experiments with various chemical salts, and drew up a paper of several closely written pages, containing the details, with all my views on the subject—which paper, by request, I sent to the New-York State Agricultural Society, last December. Of this communication, as well as of one accompanied by eight or nine samples of various qualities of guano, with the analysis of each, they did me the honor *not to take the slightest notice*. I am very sorry that I did not keep a copy of this paper, which, of course, is now amongst things lost or forgotten.

I have no doubt that this disease is completely under the dominion of science, and that a perfect remedy for it exists.

Yours, truly,

J. E. TESCHEMACHER.

Boston, Oct. 4th, 1845.

INTRODUCTION OF INDIAN CORN INTO ENGLAND.

The New-York Albion has an article on an excellent letter that was addressed to Lord Ashburton, while in the United States, in which the author takes the ground that it is very important to the welfare of the laboring classes of England, that Indian corn be admitted into the English ports from the United States, free of duty. The main points that are very forcibly urged in this letter, are, that corn would not affect the consumption of English wheat, as it would be used by those only who are unable to supply themselves with wheat; that it cannot be grown in England; that it is healthful and nutritious, and that it can be procured much cheaper than any other kind of grain. England contains more population than she can feed with wheat, and, as a dense population is indispensable to her defensive operations and prosperity, she ought to resort to some means not now used, for the purpose of supplying her poorer classes with wholesome bread. The writer estimates that a pound of Indian meal would furnish a breakfast for four persons, and that it would not cost over a penny sterling to the English consumer. He says that an English farm laborer who earns eight shillings a week, cannot use wheat, and that he ought, therefore, be able to use Indian corn.

The intrinsic importance of this subject should attract to it the attention of both countries interested in it. Recently, Great Britain has relaxed her protective system with regard to some articles of import, and she would act wisely were she to admit to her ports free of duty, Indian corn. Some attention has already been excited in the United States to the subject, and we earnestly hope that Great Britain may be induced to regard it in its true light. In consequence of a long continuance of peace with the European powers, that

nation now contains a redundant and increasing population. A large population is necessary to her defence, and such a population cannot be maintained unless it can be supplied with sufficient and wholesome food. Whenever a partial failure of her crops takes place, a vast amount of human suffering occurs, and many die of absolute starvation. Her statesman ought so to regulate her policy as to enable her laboring classes, under all circumstances, to procure enough food at low prices. In order to do this, the extinction of the duties on Indian corn would alone be necessary. The immense amount of that grain already produced in the United States, and the capacity of the country to increase the amount to meet any possible demand, very conclusively show that England might rely with entire safety on sufficient supplies of corn from this country. When we remember that the introduction of this grain into English ports would not affect the wheat culture there—that England has a redundant and ill-fed population, and that enough maize to feed all her laboring classes can be procured at low prices in the United States, we cannot but believe that the day is not very far distant when wiser counsels will prevail, and the present duty be abolished.

Closely associated with the question of admitting maize duty free into England, is another consideration of incalculable importance. It would strengthen the friendly relations of both countries, making it the paramount interest of both to be at peace, and to settle all vexed questions amicably and in a spirit of mutual forbearance and concession.

War is the greatest calamity that afflicts nations. Common sense, no less than Christianity, enjoins the necessity of preserving peace between two countries having such vast and intimate relations, commercial, moral, and intellectual. If the bad and vindictive feelings of men can be subdued by considerations of pecuniary interest, it follows very clearly that these nations should encourage and adopt such relations of mutual advantage as will make it the interest of the people of both to preserve the peace. Let maize be admitted free of duty into English ports, let the millions of England's population that now so frequently experience the pangs of hunger, be comfortably fed with it, and then it will be so entirely the obvious interest of all the corn-growers in the United States and all who are sustained by the results of their labor in England, to perpetuate pacific relations, that war between the two countries could hardly be considered a possible event.

[*Dollar Farmer.*]

CHEAP, DURABLE AND CONVENIENT FENCE.

One of the most important things in the agricultural world is fence. Our *all* as it were depends on it. Stone fence is best, but that we cannot all have. Monroe county suffers for durable fencing stuff as much perhaps as any section in the State. Consequently, I have adopted and would recommend the following method: believing

it to be the cheapest, most durable, convenient, and secure *wooden* fence that can be made. Any kind of timber even bass-wood lasts well when sawed into small rails. Saw the most lasting, straight grained timber you have into pieces four feet long, two inches thick, eight inches wide at one end and four at the other, for posts. Saw pieces six inches wide, two inches thick, and three feet long for bed pieces. Saw the rails one and three fourth inches square, and twelve feet long. Saw a board five inches wide and twelve feet long, also a piece six inches wide and four feet long. Make a shoulder across the wide end of the post, sawing in one-half inch and six inches from the end; put the post on the centre of the bed piece (setting the bed piece up edgewise) and nail it on with four nails. Bore six two inch holes in each post, at discretionary distances, boring the lower one through both pieces and enlarging the spaces as you go up between the rails, and put the cap, or five inch piece of board, on the top of the posts with nails, which board forms the top or seventh rail and preserves the heads of the post from rotting; the six inch piece of board is bored to correspond with the posts and put on to the centre of the rails to keep them from springing, (put on two of these if you please.) The posts should be slipped on to the end of the rails about three inches, and secured by a little wedge or key, drove over each, and one and a half inch pin put through about half way up the fence to attach the whole together; put the pin in loose so that the fence may be easily taken apart to move. The ends of the bed pieces should be placed on flat stones, two or three inches thick, to keep the whole steady and from rotting.— Among the conveniences and advantages of this kind of fence are the following: First, you can move it at any time, so as to plough where it stands, destroying all hedges and saving the use of the ground each year, which is always a very wide cradle swath; a sort of stone boat made light and strong on which you can place four or five lengths, is the best way to move it. A man will move and adjust one hundred rods of it in a day. Secondly, it is much more durable than other fence, because no part of it touches the ground. Thirdly, you never need bars, for each length is bars of itself. Fourthly, farmers can make it in the winter when little else can be done. Fifth, you are free from anxiety in a windy night or day, for it catches little or no wind, and consequently never blows down, and it is not liable to be pushed down by cattle. And last, though not least, comes what is nearest every man's heart, the cost. There is in each length of twelve feet, about forty feet of lumber and fourteen 10 penny nails; the labor is about the same as making ordinary board fence. So it is seen at a glance that at least one third of the expense of an ordinary board fence is saved. I have ascertained, by actual weighing, that from three to three and a half miles of this fence may be carried on one of the largest class of canal boats.

JOEL HOUGHTON.

Adams Basin, 1845.

Genesee Farmer.

ACCUMULATION OF MATERIALS FOR MANURE.

Let it be a chief object of every farmer and planter to collect from this time out till spring every substance on his premises susceptible of being converted into manure. Leaves and mould from the wood lands, weeds of all kinds, marh-mud, scrapings of roads, headlands, and fence corners, offals of the homestead, vegetable matter of all kinds—in a word, every thing that is perishable, should be carefully collected and hauled into the cattle yards and hog-pens, and so spread as to prevent wastage. Thus treated, these substances will not only serve to absorb the urine of the stock, but will by spring become so enriched as to be equal in value to the best stable or barn-yard manure. It should be borne in mind that every head of stock will in twenty-four hours discharge as much *liquid* manure—the best kind—as will furnish ammonia enough for a bushel of grain, or its equivalent in grasses. Such being the case, it should be the object, as it is the interest of husbandmen, not to permit any of it to go to waste, which it assuredly will, owing to its volatile nature, if they omit to provide the materials for absorbing and *fixing* it. The absorbents we have already named above, and we will now mention, that, in *pulverized charcoal* and *plaster*, they have the bodies which will attract, condense and retain the volatile gases we have designated.

[Am. Farmer.]

TO COOK TOMATOES.

He that does not love tomatoes is an object of pity. Every art of cooking should be employed to inveigle the appetite of every man to love a vegetable so wholesome.

Peel a dozen ripe tomatoes and fry them in a little sweet butter, (which nine Hoosiers out of ten will understand to mean a little clean lard,) together with two or three sliced green peppers; sprinkle on a little salt, and finally slice up an onion or two, and let the whole cook thoroughly. This is the Spanish mode of preparing them.

Another method, which, from a long experience we know will wear well, is as follows: The directions are for a mess of tomatoes amounting to about three pints when cooked.

Begin by parboiling two onions. While this is doing peel the tomatoes; which is easily done after hot water has been poured over them—cut them up and add the onions, also a tea-cup-ful and a half of bread crumbled fine, a table spoonful of salt, a heaping tea-spoon-ful of black pepper, a lump of butter of the size of a turkey's egg, or about four table spoonfuls. Beat these thoroughly together and set them over a slow fire to stew. They should cook slowly and for a long time; never less than three hours, but the longer the better. About fifteen minutes before they are to be used beat up

six eggs and stir them in, and put them on fresh coals and give them one grand boil up, stirring them all the time. When so cooked no directions will be needed how to eat them.

The art of cooking the tomato lies mostly in cooking them enough. They should be put to work the first thing after the breakfast things are out of the way, even if you do not dine till three.

[*Indiana Farmer.*]

THE IRISH POTATO.

The following facts, communicated by the Rev. Ezekiel Rich, late of Troy, New Hampshire, to the Genesee Farmer, very justly and briefly sets forth the value and virtues of the Irish potato, a vegetable for which there is none other that could be substituted:—*Ed. Am. Far.*

“For recommendation of this root, and encouragement in its cultivation, I will now state some of its more observable qualities:

1. It does not too highly excite the human appetite, and thus render it, like many other things, out of due proportion with the powers of digestion. This is indeed a grand affair in the province of temperance and health. Even the best varieties are not liable to be eaten to excess.

2. There is probably no kind of food that has a more just and healthful proportion of bulk and nutriment. Its soluble and nutritious matter is said to be 25 per cent.; whereas that of barley is 83, wheat 85, rice 90, beans and peas from 89 to 93. This fact renders it easy of digestion, and unlikely to surcharge the system and produce dyspepsia.

3. The potato, like milk, contains just such a proportion of aqueous substance combined with its nutriment, that it is, for both man and beast, both food and drink. This is a great convenience.

4. It is very easily grown and cooked; of course it is a very cheap article of food. Hence it goes towards supporting a dense population, and is a great blessing to the poor.

5. It does not exhaust the soil like most other vegetables, especially oats and turnips, and leaves it in a good state for the succeeding crop.

6. New varieties and the best, are easily obtained from the top-ball seeds; taking however, about three years to bring them to maturity.

7. It is very easily preserved, whether dried like fruit, or not; whether reduced to its farina or starch, or kept in its original state.”

Some one says, that the water in which potatoes have been boiled, sprinkled over plants, completely destroys all insects, in every stage of their existence, from the egg to the fly.

[*N. E. Farmer.*]

EFFECT OF NITRATE OF SODA ON GRASS LANDS.

Mr. Ebenezer Bishop, of Seekong, says he has been making use of *nitrate of soda* on his grass lands, and he thinks it has greatly benefited his crop. He has sown 100 lbs. broad-cast, to the acre, and he thinks he has four fold the grass that he would have had without it. He states that there is danger of killing vegetation if too much is sown.

Mr. Bishop's lands, consisting of a sandy loam, are the right kind of soil for the application of such substances. Ashes, potash water, pearlash, soda, &c., cannot fail to aid such a soil, and we should not marvel to see a quadruple harvest on sowing 100 weight of nitrate of soda upon an acre of it. We have never made trial of this article on our own grounds, but others have tried it with success.

[*Maine Cultivator.*]

CULTURE OF CABBAGES BY SLIPS.

The London Gardener's Chronicle gives the following directions : Cut off healthy sprouts close to the stalk of the cabbage ; let them lie in a dry cold place two or three days. Plant, and they require no farther trouble. Valuable sorts may thus be preserved unchanged, and a regular succession obtained throughout the year.

TOBACCO IN MASSACHUSETTS.

The Springfield Republican says : " The cultivation of the tobacco plant has been very largely entered into in this town and vicinity, within a year or two. One gentleman of this town has twenty-six acres of it this season. When successfully cured it proves a very profitable crop, but its cultivation requires much care, and it exhausts the soil in a large degree.

TO KILL MOSS ON ROOFS

A gentleman in Hadly states that the moss which sometimes attaches to the roof on the north side of buildings, causing a premature decay of the shingles, may be completely removed by a little dry white lead sprinkled near the top of the roof just before a rain. The rain washes it down among the moss, and, as he believes, is poisonous to it, as the moss dies and the roof is cleared. He was first led to make the trial of it from observing that while a considerable quantity of the moss grew upon a particular roof, the part opposite the chimney, which had been painted white, was entirely free from it.

[*Amherst Express.*]

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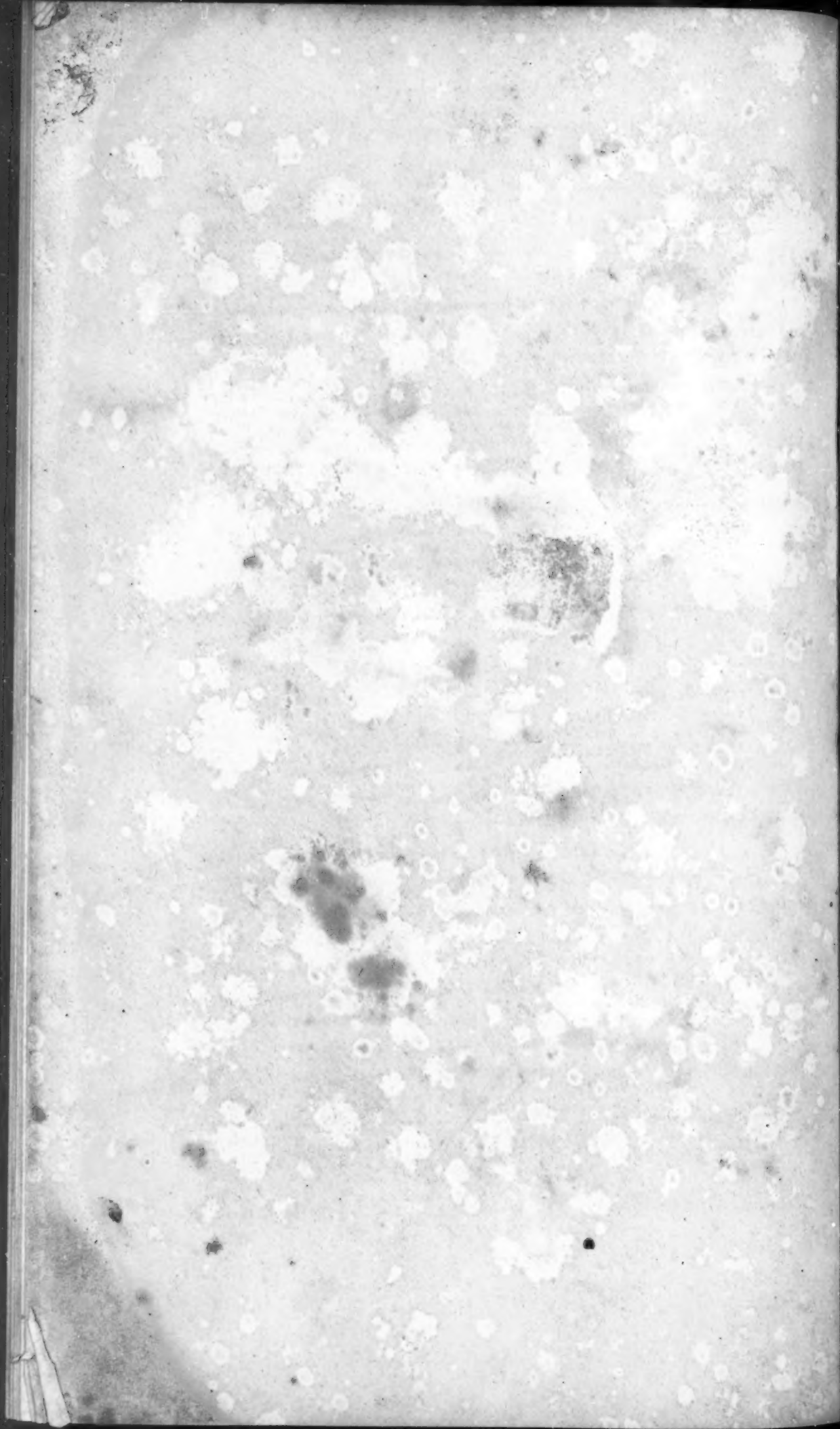
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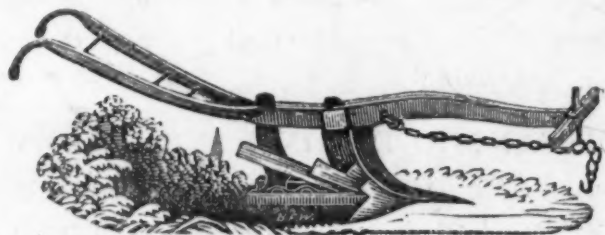
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